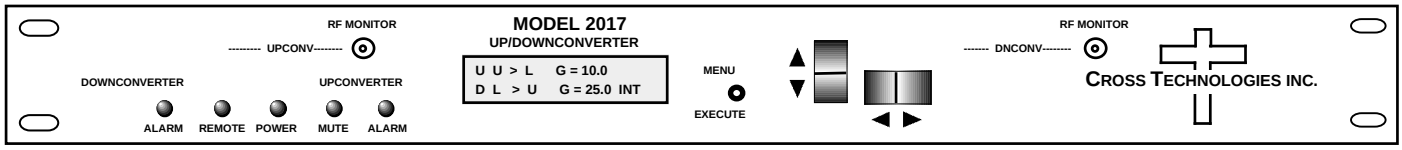
# Instruction Manual

# Model 2017-14

## UHF, L-Band, Up/Downconverter

**January 2013, Rev. 0**




Data, drawings, and other material contained herein are proprietary to Cross Technologies, Inc., but may be reproduced or duplicated without the prior permission of Cross Technologies, Inc. for purposes of operating the equipment. Printed in USA.

When ordering parts from Cross Technologies, Inc., be sure to include the equipment model number, equipment serial number, and a description of the part.

**CROSS TECHNOLOGIES, INC.**

6170 Shiloh Road

Alpharetta, Georgia 30005

(770) 886-8005

FAX (770) 886-7964

Toll Free 888-900-5588

WEB www.crosstechnologies.com

E-MAIL info@crosstechnologies.com

**INSTRUCTION MANUAL**

# MODEL 2017-14 UHF, L-Band, Up/Downconverter

**TABLE OF CONTENTS** **PAGE**


**Warranty** **2**
**1.0 General** **3**
1.1 Equipment Description **3**
1.2 Technical Characteristics **4**
1.3 Monitor & Control Interface **5**
1.4 Environmental Use Information **8**
**2.0 Installation** **9**
2.1 Mechanical **9**
2.2 Rear I/O's **10**
2.3 Front Panel Controls, Indicators **12**
2.4 Operation **13**
2.5 Menu Settings **15**


**WARRANTY** - The following warranty applies to all Cross Technologies, Inc. products.

All Cross Technologies, Inc. products are warranted against defective materials and workmanship for a period of one year after shipment to customer. Cross Technologies, Inc.'s obligation under this warranty is limited to repairing or, at Cross Technologies, Inc.'s option, replacing parts, subassemblies, or entire assemblies. Cross Technologies, Inc. shall not be liable for any special, indirect, or consequential damages. This warranty does not cover parts or equipment which have been subject to misuse, negligence, or accident by the customer during use. All shipping costs for warranty repairs will be prepaid by the customer. There are not other warranties, express or implied, except as stated herein.

**CROSS TECHNOLOGIES, INC.**

6170 Shiloh Road

Alpharetta, Georgia 30005

(770) 886-8005

FAX (770) 886-7964

Toll Free 888-900-5588

WEB www.crosstechnologies.com

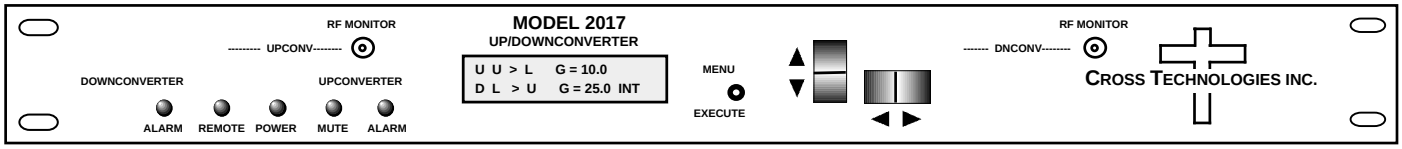
E-MAIL info@crosstechnologies.com

# MODEL 2017-14 UHF, L-Band, Up/Downconverter

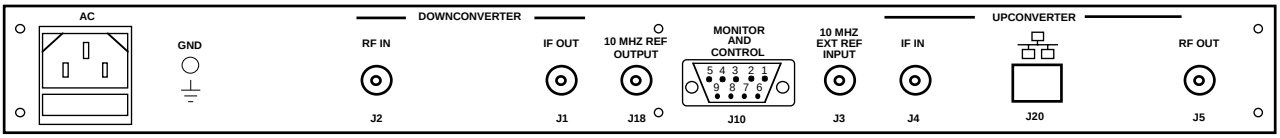
## 1.0 General

### 1.1 Equipment Description

The 2017-14 UHF, L-band Up/Downconverter converts 0.2-0.4 GHz to 1.2-1.4 GHz (Up) and 1.2-1.4 GHz to 0.2-0.4 GHz (Down). Multi-function switches select the gain (0 to +30 dB range for the Upconverter and Downconverter), and other parameters. Front panel LEDs provide indication of DC power (green), PLL alarm (red), remote operation (yellow), and Upconverter mute (yellow). Remote operation allows selection of gain and external 10 MHz Reference (Option E1). Gain settings appear on the LCD display. Connectors are BNC female for UHF and the optional external reference input and output (OPTION E1), and Type F female for L-band. A high stability (±0.01 ppm Option H) option is also available. It is powered by a 100-240 ±10% VAC power supply and housed in a 1.75" X 19" X 16" 1RU chassis.




**FRONT PANEL**




**REAR PANEL**

**Figure 1.1 Model 2017-14 Front and Rear Panels**

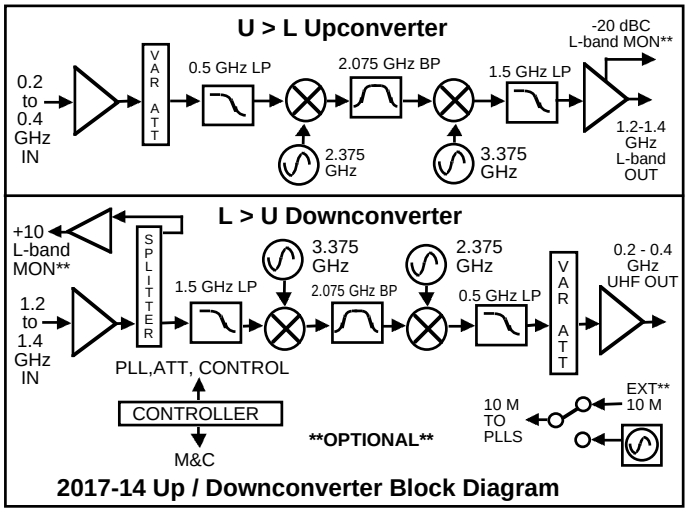



**Figure 1.2 Model 2017-14 Up/Downconverter Block Diagram**

## 1.2 Technical Characteristics

**TABLE 1.0 2017-14 UHF, L-Band, Up/Downconverter Specifications***

| UPCONVERTER | |
|---|---|
| **Input Characteristics (UHF, L)** | |
| Impedance/Return Loss | 50Ω / 14 dB |
| Frequency | 0.2 to 0.4 GHz |
| Noise Figure, maximum | 20 db @ max. gain |
| Input Level Range | -40 to -25 dBm |
| **Output Characteristics** | |
| Impedance/Return Loss | 50Ω / 14 dB |
| Frequency (GHz) | 1.2 to 1.4 GHz |
| Output Level Range | -15 to 0 dBm |
| 1 dB Comp, maximum gain | +10 dBm |
| Mon. Level (Option W78) | -20 dBC OUT (±3 DB) |
| Mute @ 0 dBm Out | > 60 dB |
| **Channel Characteristics** | |
| Gain, Maximum at Fc | +30 ± 3 dB |
| Gain, Range, 0.5dB steps | +30 to 0 dB |
| Image Rejection | < -55 dBC, minimum |
| Spurious, in Band, Signal rel. | < -55 dBC, 0 dBm |
| Spurious, in Band, Signal ind.. | < -60 dBm |
| Spurious, Out of Band | < -55 dBm |
| Intermod - 2 Carriers | < -50 dBm |
| Frequency Response Band | ± 2 dB |
| Frequency Response, 40 MHz | ± 0.5 dB |
| Frequency Sense | Non-inverting |

| DOWNCONVERTER | |
|---|---|
| **Input Characteristics (L, UHF)** | |
| Impedance/Return Loss | 50Ω / 14 dB |
| Frequency | 1.2 to 1.4 GHz |
| Noise Figure, maximum | 15 @ max. gain |
| Input Level Range | -50 to -30 dBm |
| **Output Characteristics** | |
| Impedance/Return Loss | 50Ω / 14 dB |
| Frequency (GHz) | 0.2 to 0.4 GHz |
| Output Level Range | -20 to 0 dBm |
| 1 dB Comp, maximum gain | +10 dBm |
| Mon. Level (Option W78) | +10 dBm IN (±3 DB) |
| Mute @ 0 dBm Out | N/A |
| **Channel Characteristics** | |
| Gain, Max at Fc | +30 ± 3 dB |
| Gain, Range, 0.5dB steps | +30 to 0 dB |
| Image Rejection | > 50 dB, minimum |
| Spurious, in Band, Signal rel. | < -50 dBC, 0 dBm |
| Spurious, in Band, Signal ind. | < -60 dBm |
| Spurious, Out of Band | < -45 dBm |
| Intermod - 2 Carriers | < -50 dBm |
| Frequency Response Band | ± 2 dB |
| Frequency Response, 40 MHz | ± 0.5 dB |
| Frequency Sense | Non-inverting |

| Downconverter 2nd Harm | |
|---|---|
| ≥ -40 dBc @ maximum input level | .2 - .4 GHz Out |

| Synthesizer Characteristics | |
|---|---|
| Frequency Accuracy | ± 1.0 ppm internal reference (±0.01 ppm, Option -H) |
| Frequency Step | NONE, Fixed Frequency |

| Phase Noise @ Frequency | 100 MHz | 1kHz | 10kHz | 100kHz | 1MHz |
|---|---|---|---|---|---|
| dBC/Hz | -75 | -80 | -85 | -100 | -110 |

| | |
|---|---|
| 10 MHz Level In/Out Level | 3 dBm ± 3 dB, 75 ohms (Option E1) |
| **Controls, Indicators** | |
| Gain Selection | Direct readout LCD; pushbutton switches or remote selection |
| Power/Alarm/Remote | Green LED, Red LED, Yellow LED |
| Remote | RS232C, 9600 baud; (RS485, Option Q, Ethernet Optional) |
| **Other** | |
| RF/IF (UHF) Connector | Type F (female) / BNC (female) |
| 10 MHz Connectors | BNC (female), 50Ω/75Ω |
| Alarm/Remote Connector | DB9 - NO or NC contact closure on Alarm |
| Size | 19 inch, 1 RU Standard Chassis, 1.75” high X 16.0” deep |
| Power | 100-240 ± 10% VAC, 47-63 Hz, 45 watts maximum |

*+10˚C to +40˚C; Specifications subject to change without notice.

© 2013 Cross Technologies, Inc.

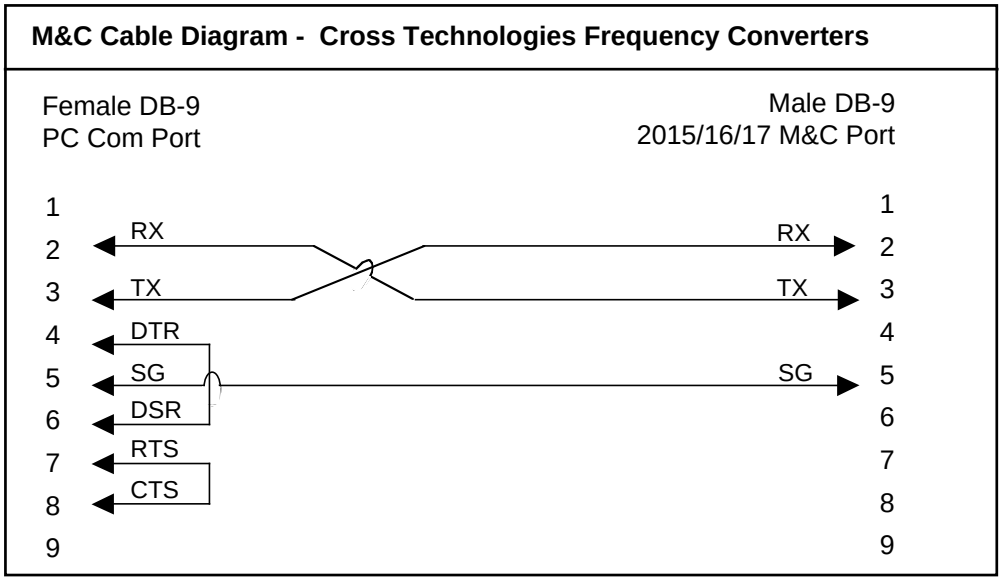
## 1.2 Technical Characteristics continued...

| **Available Options: UHF, L-Band Up/Downconverter** | |
|---|---|
| - E1 | External 10 MHz Reference / Auto Switch |
| - H | High stability (±0.01 ppm) Internal Reference |
| - W78 | RF/RF Monitor Ports (Front Panel) |
| - W31 | External Temperature 0C to +50C |
| **Remote M&C Interfaces** | |
| - O | RS485/422 |
| - W8 | Ethernet; with Web Browser |
| - W18 | Ethernet; with Web Browser and SNMP |
| - W28 | Ethernet; with TCP/IP, Telnet® |
| **Connectors/Impedance** | |
| - B | 75Ω BNC (RF), 75Ω BNC (IF) |
| - C | 50Ω BNC (RF), 75Ω BNC (IF) |
| - D | 50Ω BNC (RF), 50Ω BNC (IF) |
| - J | 75Ω F-Type (RF), 50Ω BNC (IF) |
| - N | 50Ω N-Type (RF), 75Ω BNC (IF) |
| - M | 50Ω N-Type (RF), 50Ω BNC (IF) |
| - S | SMA, 50Ω (RF), 50Ω BNC (IF) |
| © 2013 Cross Technologies, Inc. | |

## 1.3 Monitor and Control Interface

### A) Remote serial interface

**Protocol**: RS-232C, 9600 baud rate, no parity, 8 data bits, 1 start bit, and 1 stop bit.
(RS-232C, RS-422, or **RS-485 - option -Q**)




**Connector**: Rear panel, DB-9 male

| J10 Pinouts (RS-232C/422/485) | |
|---|---|
| **Pin** | **Function** |
| 1 | Rx- |
| 2 | Rx+ (RS-232C) |
| 3 | Tx+ (RS-232C) |
| 4 | Tx- |
| 5 | GND |
| 6 | Alarm Relay: Common |
| 7 | Alarm Relay: Normally Open |
| 8 | Not Used |
| 9 | Alarm Relay: Normally Closed |

## B) Status Requests

Table 1.1 lists the status requests for the 2017-14 and briefly describes them.

*** PLEASE NOTE: The two character {aa}(00-31) prefix, in the table below, should be used ONLY when RS-485, (OPTION-Q), is selected.**

**Table 1.1 2017-14 Status Requests**

| Command | Syntax* | Description |
|---|---|---|
| Command Status | {aaS1} | Returns {aaS1bbbcccdefg} where: |
| | | • bbb = Upconverter Gain (000 to 300) 00.0 to 30.0 dB |
| | | • ccc = Downconverter Gain (000 to 300) 00.0 to 30.0 dB |
| | | • d - Receiver synth alarm: 0 = normal, 1 = alarm |
| | | • e - Transmitter synth alarm: 0 = normal, 1 = alarm |
| | | • f - Summary alarm: 0 = normal, 1 = alarm |
| | | • g - Transmit signal disabled: 0 = muted, 1 = not muted |
| External 10MHz (option -E) | {aaS2} | Returns {aaS2bc} where: |
| | | • b - Reference Mode where: |
| | | 1 = Internal, 2 = External, 3 = Auto |
| | | • c = Current Reference where: |
| | | 1 = Internal, 2 = External |
| | | |

## C) Commands

Table 1.2 lists the commands for the 2017-14 and briefly describes them. After a command is sent the 2017-14 sends a return ">" indicating the command has been received and executed.

**General Command Format** - The general command format is {aaCND...}, where:

{ = start byte
aa = address (RS-485 only **option -Q**)
C = 1 character, either C (command) or S (status)
N = 1 character command or status request
D = 1 character or more of data (depends on command)
} = stop byte

*** PLEASE NOTE: The two character {aa}(00-31) prefix, in the table below, should be used ONLY when RS-485, (OPTION-Q), is selected.**

**Table 1.2 2017-14 Commands**

| Command | Syntax* | Description |
|---|---|---|
| Set Transmit Gain | {aaC3xxx} | where: |
| | | • xxx = 3 characters |
| | | • Range: 000 to 300 (00.0 to 30.0 in 0.5 dB steps) |
| Set Receiver Gain | {aaC4xxx} | where: |
| | | • xxx = 3 characters |
| | | • Range: 000 to 300 (00.0 to 30.0 in 0.5 dB steps) |
| Enable Tx | {aaCAx} | where x =: |
| | | • 0 to disable Tx signal |
| | | • 1 to enable Tx signal |
| 10MHz Reference (option -E1) | {aaCEx} | where x =: |
| | | • 1 = Internal Reference |
| | | • 2 = External Reference |
| | | • 3 = Auto Reference |
| Enable Remote | # | Just # sign |
| Disable Remote | {aaCR0}* | {CR and zero} |
| | | |

## 1.4 Environmental Use Information

**A**. **Rack-Mounting** - To mount this equipment in a rack, please refer to the installation instructions located in the user manual furnished by the manufacturer of your equipment rack.

**B.** **Mechanical Loading** - Mounting of equipment in a rack should be such that a hazardous condition does not exist due to uneven weight distribution.

**C**. **Elevated Operating Ambient Temperature** - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, consideration should be given to Tmra.

**D.** **Reduced Air Flow** - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. Additional space between units may be required.

**E.** **Circuit Overloading** - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits could have on over current protection and supply wiring. Appropriate consideration of equipment name plate rating should be used when addressing this concern.

**F.** **Reliable Earthing** - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connection to the Branch (use of power strips).

**G.** **Top Cover** - There are no serviceable parts inside the product so, the Top Cover should not be removed. If the Top Cover is removed the ground strap and associated screw MUST BE REINSTALLED prior to Top Cover screw replacement. FAILURE TO DO this may cause INGRESS and/or EGRESS emission problems.

## 2.0 Installation

### 2.1 Mechanical

The 2017-14 consists of one RF/Controller PCB housed in a 1 RU (1 3/4 inch high) by 16 inch deep chassis. A switching, ± 12, +24, +5 VDC power supply provides power for the assemblies. The 2017-14 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2017-14 is assembled.

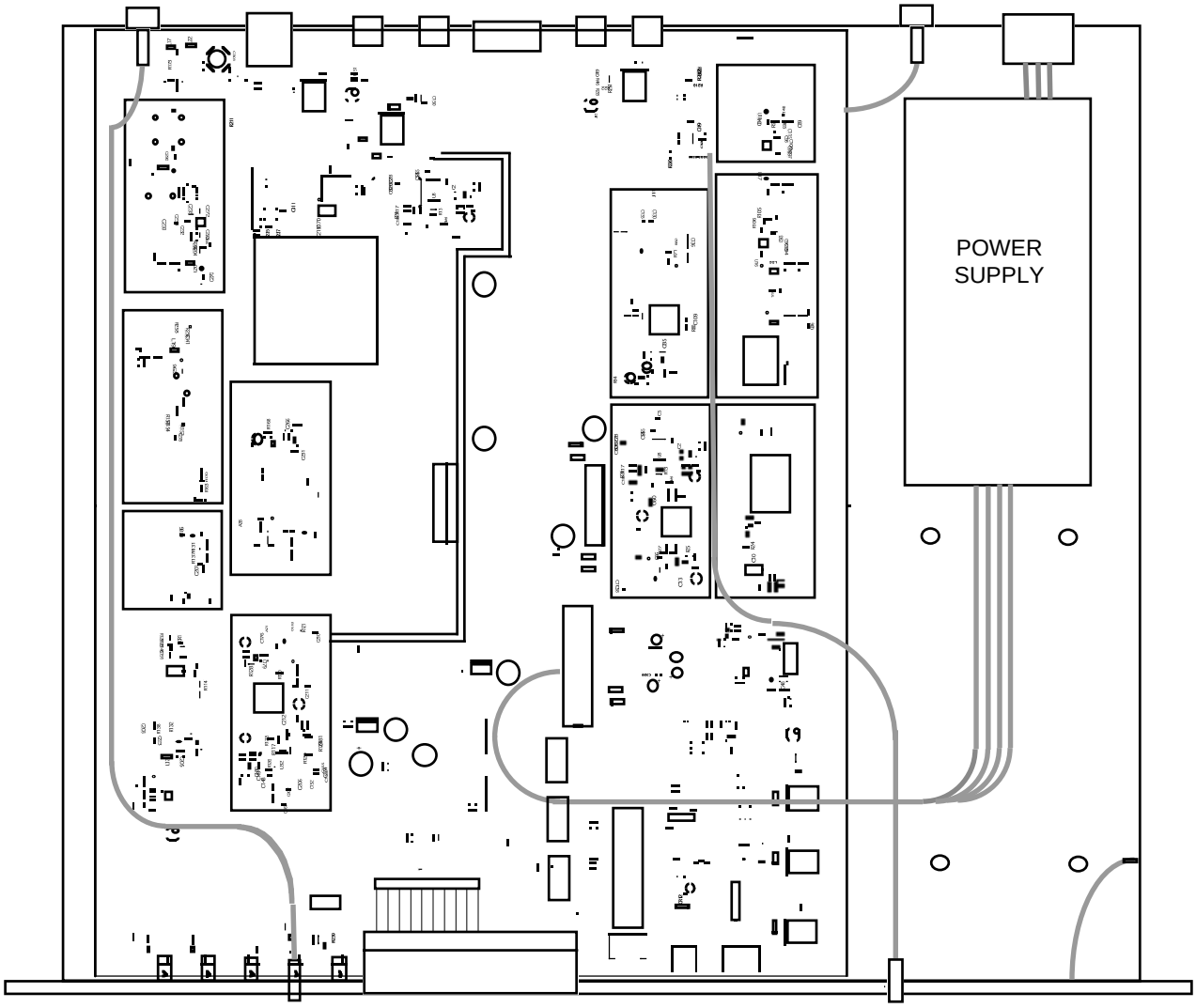



**Figure 2.0 Model 2017-14 Mechanical Assembly**

## 2.2 Rear Panel Input/Output Signals and Control -

Figure 2.2 shows the input and output connectors on the rear panel.

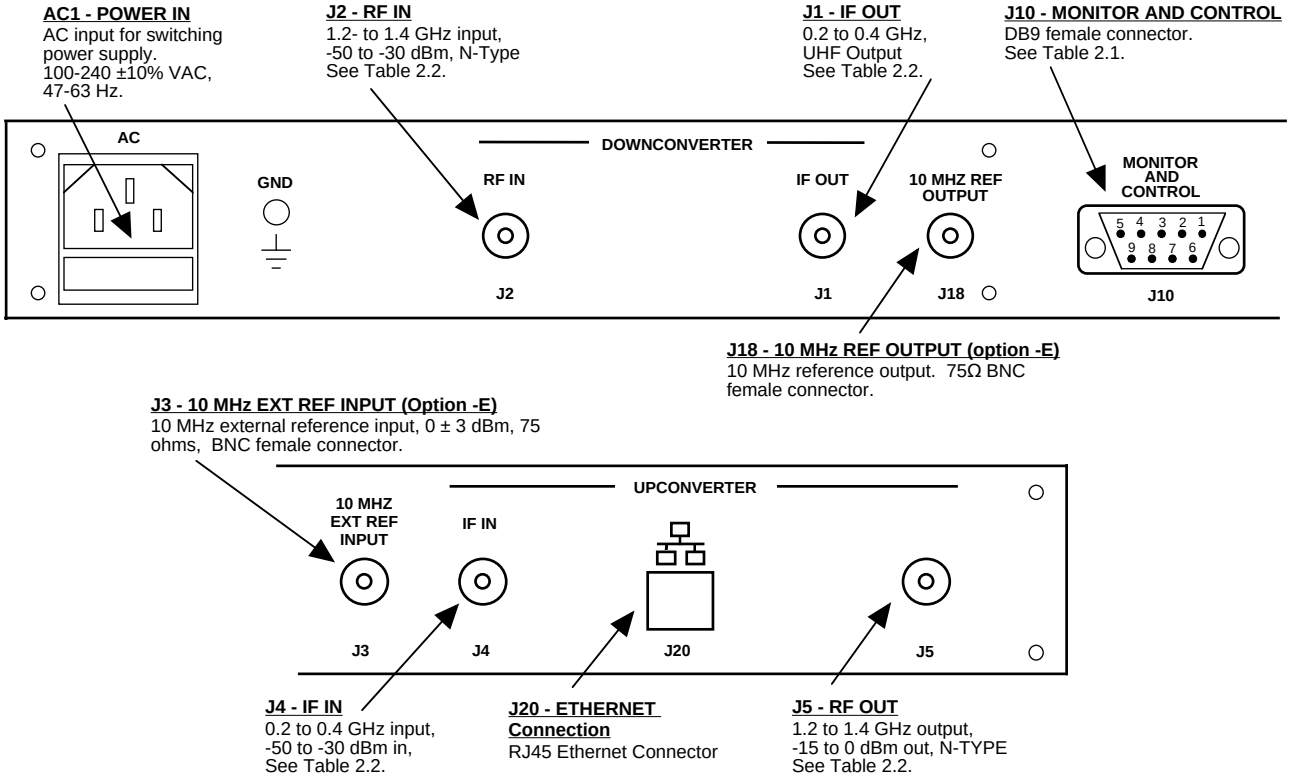



**Figure 2.1 Model 2017-14 Rear Panel I/O's**

**Tables 2.1 & 2.2** shows the input and output connectors on the rear panel.

| TABLE 2.1 J10 Pinouts (RS-232C/422/485*) | |
|---|---|
| **Pin** | **Function** |
| 1 | Rx- |
| 2 | Rx+ (RS-232C) |
| 3 | Tx+ (RS-232C) |
| 4 | Tx- |
| 5 | GND |
| 6 | Alarm Relay: Common |
| 7 | Alarm Relay: Normally Open |
| 8 | Not Used |
| 9 | Alarm Relay: Normally Closed |

***Remote Serial Interface**

Interface: DB-9 Male -- Protocol: RS-232C (RS-232C/422/485 **option -Q**), 9600 baud rate, no parity, 8 data bits, 1 start bit, 1 stop bit.

| TABLE 2.2 IF/RF Connector Options | | |
|---|---|---|
| **Option** | **IF** | **RF** |
| STD | BNC, 75Ω | Type F, 75Ω |
| -B | BNC, 75Ω | BNC, 75Ω |
| -C | BNC, 75Ω | BNC, 50Ω |
| -D | BNC, 50Ω | BNC, 50Ω |
| -J | BNC, 50Ω | Type F, 75Ω |
| -N | BNC, 75Ω | Type N, 50Ω |
| -M | BNC, 50Ω | Type N, 50Ω |
| -S | BNC, 50Ω | SMA, 50Ω |

## 2.3 Front Panel Controls and Indicators -

The following are the front panel controls and indicators.

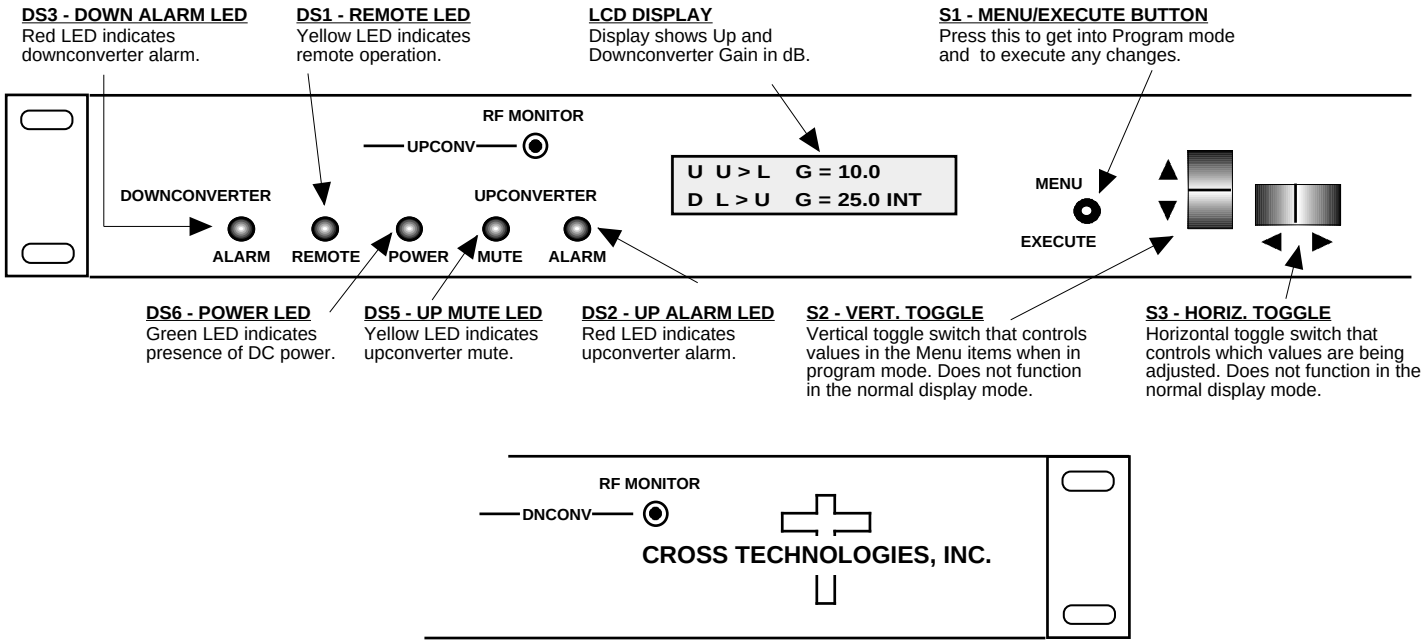

DS3 - DOWN ALARM LED
Red LED indicates downconverter alarm.
DS1 - REMOTE LED
Yellow LED indicates remote operation.
LCD DISPLAY
Display shows Up and Downconverter Gain in dB.
S1 - MENU/EXECUTE BUTTON
Press this to get into Program mode and to execute any changes.
RF MONITOR
UPCONV
DOWNCONVERTER
UPCONVERTER
U U > L G = 10.0
D L > U G = 25.0 INT
MENU
EXECUTE
ALARM
REMOTE
POWER
MUTE
ALARM
DS6 - POWER LED
Green LED indicates presence of DC power.
DS5 - UP MUTE LED
Yellow LED indicates upconverter mute.
DS2 - UP ALARM LED
Red LED indicates upconverter alarm.
S2 - VERT. TOGGLE
Vertical toggle switch that controls values in the Menu items when in program mode. Does not function in the normal display mode.
S3 - HORIZ. TOGGLE
Horizontal toggle switch that controls which values are being adjusted. Does not function in the normal display mode.
RF MONITOR
DNCONV
CROSS TECHNOLOGIES, INC.

**Figure 2.2 Model 2017-14 Front Panel Controls and Indicators**

## 2.4 Installation / Operation

### 2.4.1 Installing and Operating the 2017-14, Upconverter Section

1.) Connect a -40 dBm to -25 dBm signal to IF In, J4 (Figure 2.1).
2.) Connect the RF OUT, J5, to the external equipment.
3.) Connect 100-240 ±10% VAC, 47 - 63 Hz to AC on the back panel.
4.) Be sure DS6 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).

### 2.4.2 Installing and Operating the 2017-14, Downconverter Section

1.) Connect a -50 dBm to -30 dBm signal to RF In, J2 (Figure 2.1).
2.) Connect the IF OUT, J1, to the external equipment.
3.) Connect 100-240 ±10% VAC, 47 - 63 Hz to AC on the back panel.
4.) Be sure DS6 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).
5.) **AC Fuse -** The fuse is a 5 mm X 20 mm, 2 amp slow blow (Type T) and is inserted in the far slot in the drawer below the AC input as shown in Figure 2.3. There is a spare fuse in the near slot. If a fuse continues to open, the power supply is most likely defective.

### 2.4.3 External 10 MHz Reference Operation

The External Reference Option is required if the unit is to synch to a 10 MHz reference from an *external* source. The unit will still have an internal 10 MHz reference as a 'back-up' should the external reference be removed or fail. Described below are the two (2), 10 MHz External Reference Options, Option E & E1.

**<u>Option E</u>**

**Internal Reference Mode**
When the internal reference mode is selected, the unit's internal 10 MHz reference will become the 'primary' source and the unit's synthesizers will lock to this internal 10 MHz reference. The unit will ignore any external 10 MHz signal present on the external reference input (J13). The unit will also buffer the internal 10 MHz signal and provide it on the Reference Out connector (J14) at +3 dBm, +/- 3 dB.

**External Reference Mode**
When the external reference mode is selected, the external 10 MHz reference (received on J13) will become the 'primary' source and the unit's synthesizers will lock to this external 10 MHz reference. The unit *must* have a 10 MHz signal connected to the external reference input (J13) on the rear panel. The external 10 MHz signal must be +3 dBm, +/- 3 dB. The unit will also buffer the external 10 MHz signal and provide it on the Reference Out connector (J14) at +3 dBm, +/- 3 dB.

NOTE: There is no "auto-detect" capability in Option E. [See Option E1 below if this capability is required.] If the External Reference Mode is selected and the external reference fails or is removed, the unit will ALARM, but it will NOT automatically switch to the internal reference. The user will be required to manually select Internal Reference Mode (via the front panel LCD or Remote M&C) for the *internal* 10 MHz reference to become the 'primary' source for the unit.

Once the external 10 MHz reference is restored (on J13), the user must again manually (via the front panel LCD or Remote M&C) reselect External Reference Mode for the *external* 10 MHz reference to become the 'primary' source.

L-band units with option E also have the ability to 'insert' the (internal or external) 10 MHz signal that has been buffered (as described above) on the center pin of the L-band (RF) connector(s).

**Option E1**

Units with option E1 operate as described above but also have an Auto mode. When in auto mode the unit will detect and select the external 10 MHz signal if it is present and at least +3 dBm. If the external 10 MHz signal falls below 1 dBm (+/- 1 dB) the unit will automatically switch to the internal 10 MHz reference. The reference out connector (J14) provides a buffered rendition of the selected 10 MHz signal at +3 dBm, +/- 3 dB.

Units with option E1 do not have the ability to insert a buffered rendition of the selected 10 MHz signal on the center pin of the (RF) connector.

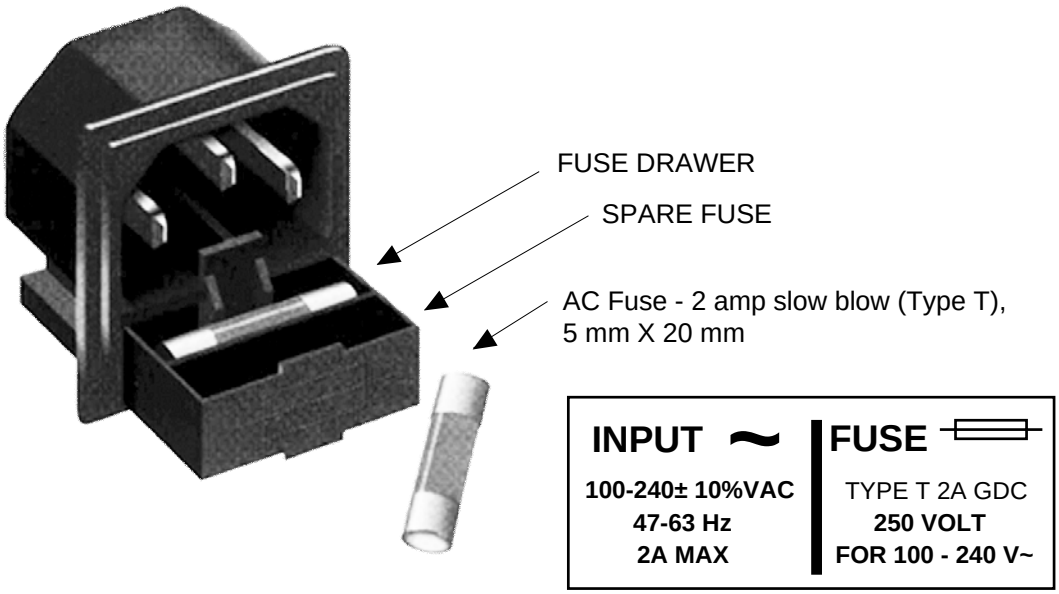



**Figure 2.3 Fuse Location and Spare Fuse**

## 2.5 Menu Settings

**2.5.1 Functions** - This section describes operation of the front panel controls. There are three operator switches, the LCD display and alarm indicator LEDs. All functions for the equipment are controlled by these components. The functions are (See Figure 2.2):

**Power Up**
**Normal Display**

| | |
|---|---|
| **Menu 1** | Up Gain (+30 to 0) |
| **Menu 2** | Down Gain (+30 to 0) |
| **Menu 3** | Select External 10 MHz Ref (option -E) |
| **Menu 4** | Up Mute |
| **Menu 5** | Set Unit to Remote Operation |
| **Menu 6** | Select Ethernet |

**Save Menu** At the end or when "R" is selected from any of the above menus

Alarm indications appear on the LEDs (see figure 2.2).

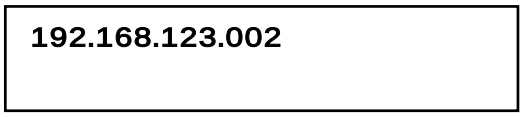
All program changes must start with the operation of the Menu/Execute switch and must also end with the operation of the Menu/Execute switch verified by the "Save Settings?" Menu. If this sequence is not followed, none of the changes will take effect. If programming is initiated and no operator action takes place for approximately 12 seconds (before the final press of the Menu/Execute switch) the display will revert to its previous status and you will need to start over.

### 2.5.2 Power-On Settings

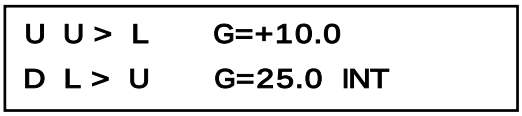
**NOTE: THE LAST STATUS OF A UNIT IS RETAINED EVEN WHEN POWER IS REMOVED. WHEN POWER IS RESTORED, THE UNIT WILL RETURN TO IT'S PREVIOUS SETTINGS.**

When power is first applied, the LCD display goes through three steps.

1. The IP address is displayed
2. The software version and model number will be displayed.



3. The present frequency and gain of the up and Downconverter is shown.




The unit is now operational and ready for any changes the operator may desire.

### 2.5.3 Control Switches

1. Menu/Execute - Any change to the programming of the unit must be initiated by pressing the Menu/Execute switch and completed by pressing the Menu/Execute switch.
2. Horizontal Switch - This switch is mounted so its movement is horizontal and moves the cursor left or right.
3. Vertical Switch - This switch is mounted so its movement is vertical and has two functions:
    a. During frequency , gain, input level changes, the vertical movement will raise or lower the number in the direction of the arrows.
    b. For other functions such Mute on/off, the vertical switch will alternately turn the function on or off regardless of the direction operated.

### 2.5.4 Gain Changes

When you get to this menu note that the gain changes will be made as you make them but if you do not wish to save the changes you have made, scroll to **"R"** and push the menu/Execute switch and select **"NO"** in the **"SAVE SETTINGS?"** window or **do not press the Menu/Execute switch**; simply do nothing for approximately 12 seconds, and the system will return to the normal operating mode.

#### 2.5.4.1 Upconverter Gain

To set the Upconverter gain, first push the Menu/Execute switch to get to the gain setting:

Operate the Menu/Execute switch until you get to the menu item you want to change see Figure 2.4 for the sequence of menu options.

```
UP  G = +25.5                R
```

By using the horizontal rocker switch the cursor can be moved left or right .
Pressing the Up/Down switch down will toggle the display digit selected until you have the desired gain.

**NOTE: THE GAIN WILL BE CHANGED AS YOU ADJUST THE NUMBERS. HOWEVER, THE VALUE WILL NOT BE STORED UNTIL YOU INDICATE YES IN THE SAVE SETTINGS WINDOW. DO NOT SET A GAIN THAT WOULD EXCEED A 0 dBm OUTPUT LEVEL.**

When the display indicates the value desired you can push the Menu/Execute switch to the next item OR you can scroll to "R", push the Menu/Execute switch to get to:

```
SAVE SETTINGS?          Y N
```

Selecting **Y** will save the new settings. Selecting **N** will revert to the previous settings.
Pushing the Menu/Execute switch then takes you to the :

```
U  U > L     G=+10.0
D  L > U     G=25.0  INT
```

Figure 2.4 shows all the menu items and how to make changes.

### 2.5.4.2 Downconverter Gain

To set the Downconverter gain, first push the Menu/Execute switch to get to the gain setting:

Operate the Menu/Execute switch until you get to the menu item you want to change see Figure 2.4 for the sequence of menu options.

The following display is for changing the Downconverter gain. This is an important setting to optimize spurious and should be made as accurately as possible to provide an output in the -20 to 0 dBm level range:

```
DN  G = +30.0                R
```

Pressing the Up/Down switch to change the level in 0.5, 1, or 10 dB steps. By using the horizontal rocker switch the cursor can be moved left or right. Pressing the Up/Down switch down will toggle the display digit selected until you have the desired gain.

**NOTE: THE GAIN WILL BE CHANGED AS YOU ADJUST THE NUMBERS. HOWEVER, THE VALUE WILL NOT BE STORED UNTIL YOU INDICATE YES IN THE SAVE SETTINGS WINDOW.**

When the display indicates the value desired you can push the Menu/Execute switch to the next item OR you can scroll to "R", push the Menu/Execute switch to get to:

```
SAVE SETTINGS?          Y N
```

Selecting **Y** will save the new settings. Selecting **N** will revert to the previous settings.
Pushing the Menu/Execute switch then takes you to the :

```
U  U > L     G=+10.0
D  L > U     G=25.0  INT
```

Figure 2.4 shows all the menu items and how to make changes.

### 2.5.4.3 Alarm Indications

An alarm condition for will occur if any local oscillator phase lock loop (PLL) comes out of lock.

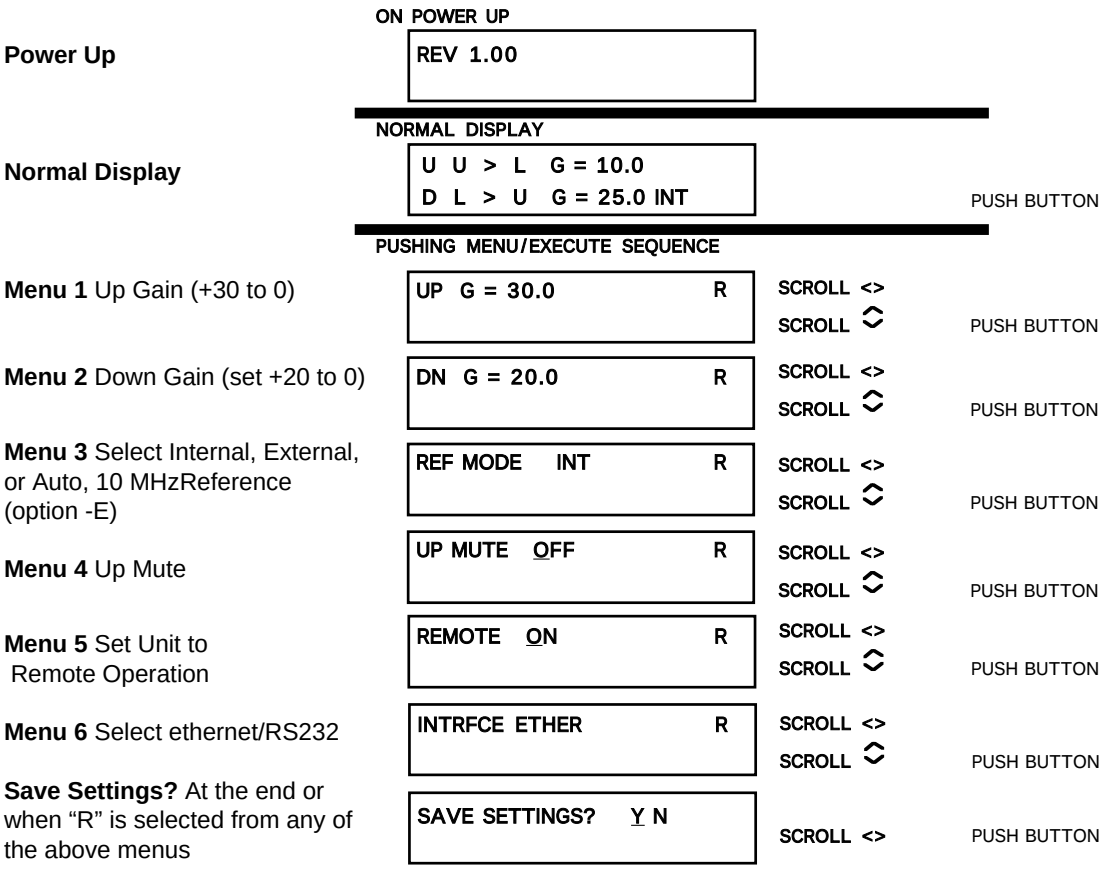
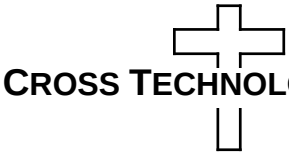



**Figure 2.4 Menu Display and Sequence**



**CROSS TECHNOLOGIES, INC.**

6170 Shiloh Road
Alpharetta, Georgia 30005

(770) 886-8005
FAX (770) 886-7964
Toll Free 888-900-5588

WEB www.crosstechnologies.com
E-MAIL info@crosstechnologies.com

PRINTED IN USA